

SWBAT: identify misconceptions about current
define resistance

Jan 4-7:20 AM

Welcome!!!

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SECA Physics
Friday 28 February 2014

Centering

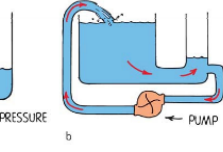
- * Pick up:
 - 2 slips of paper (1 for later)
 - get your concept sheet from the shelf
 - white board, eraser, marker


Opening Questions: (on 1 slip of paper)

Name:

What's confusing so far in this electricity stuff?

Sep 7-7:04 AM


 t: 6 rows total
 An electron is $1.6 \times 10^{-19} \text{ C} = .000000000000000000016 \text{ C}$

	Meaning	Symbol	Units	Analogy
CHARGE	PROPERTY OF PROTONS & ELECTRONS THAT CAUSES ATTRACTION & REPULSION	q	COULOMBS C	WATER WATER ITSELF
VOLTAGE =ELECTRIC POTENTIAL	POTENTIAL BASED ON POSITION IN AN ELECTRIC FIELD "PUSH"	V	VOLTS V $V = \frac{J}{C}$	- PUMP - PRESSURE DIFFERENCE - HEIGHT
CURRENT	THE FLOW OF ELECTRIC CHARGE $= \frac{\text{CHARGE}}{\text{TIME}}$	I $I = \frac{q}{t}$	AMPERE A $1A = \frac{1C}{s}$	FLOW OR MOTION OF WATER 

Feb 23-7:34 AM

Electrons in a wire demo

How many protons in the wire? $||$

How many electrons in the wire? $||$

Is the wire positive, negative, or neutral? (+, -, or 0)

How many electrons are in the wire while / after current flows? $||$

What charge is the wire now? (+, -, or 0)

T/F: The electron that got pushed in is the one that came out

T/F: Something came out of the wire as soon as something went in
(The flow was fast)

T/F: The electrons inside moved super fast, raced from one end of the tube to the other.

Feb 28-7:46 AM

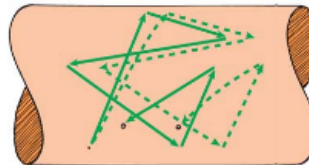
"Current" misconceptions...TRUTH

- 1) WIRES ARE ALWAYS FULL OF PROTONS & ELECTRONS
- 2) FLOW STARTS SUPER FAST. ELECTRONS MOVE SLOWLY
- 3) Wires are neutral when a current is flowing through them !

$$\bar{e} \text{ IN} \Rightarrow \bar{e} \text{ OUT}$$

FIGURE 34.14 ▶


The solid lines depict a random path of an electron bouncing off atoms in a conductor. The dashed lines show an exaggerated view of how this path changes when an electric field is applied. The electron drifts toward the right with an average speed less than a snail's pace.

MISCONCEPTION

- X1) Wires are empty of electrons and filled up when there's a current
- X2) Electrons flow super fast
- X3) WIRES GET NEGATIVELY CHARGED BY EXTRA ELECTRONS

Feb 23-7:43 AM

Concept sheet: 6 rows total

Concept	Meaning	Symbol	Units	Analogy
CHARGE	PROPERTY OF PROTONS & ELECTRONS THAT CAUSES ATTRACTION & REPULSION	q	COULOMBS C	
VOLTAGE = ELECTRIC POTENTIAL	POTENTIAL BASED ON POSITION IN AN ELECTRIC FIELD "PUSH"	V	VOLTS V $V = \frac{J}{C}$	- PERSON - PEDALING \Rightarrow THE PUSH
CURRENT	THE FLOW OF ELECTRIC CHARGE $= \frac{\text{CHARGE}}{\text{TIME}}$	I $I = \frac{q}{t}$	AMPERE A $1A = \frac{1C}{s}$	- WHEEL CHAINS MOVING
RESISTANCE	OPPOSITION OF CURRENT "AGAINST THE FLOW"	R	OHMS Ω	BRAKES

$$\frac{q}{I \cdot t}$$

Feb 23-7:34 AM

Current, Voltage, and Resistance: The Bicycle Analogy

If I were to pedal a bike while gently squeezing the hand brakes, what in that situation would be like
current?
voltage?
resistance?

I: WHEELS, CHAIN, MOVING
V: PUSH
R: BRAKES



Mar 7-7:33 AM

BASE LEVEL	BASE LEVEL	BASE SPEED
VOLTAGE Pedaling Effort	RESISTANCE Braking	CURRENT Speed of bike?
Same	More	SLOWER
Same	Less	FASTER
More	Same	FASTER
Less	Same	SLOWER

Feb 23-7:43 AM

Daily 3 Questions

CP - No Homework!

- * Every day except test/project days
- * 3 Questions on the topics of the day
- * Main source of daily points
- * I am happy to give credit when I have no concerns about someone giving or getting help with the answers.

You can't get your points if you don't have your NAME!!!

Name	Period
1.	
2.	
3.	

Sep 9-7:32 AM

1. True or False: **Wires become negatively charged** by the electrons pumped into them when they have a current flowing through them.

2. Resistance is defined as the opposition of CURRENT

3. In our bike analogy, the brakes are like

- A. current
- B. voltage
- C. resistance

Feb 18-6:59 AM